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EXAMINER	
CEPERLEY, MARY	

ART UNIT	PAPER NUMBER
1641	9

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,999	KLAPPROTH, HOLGER	
	Examiner	Art Unit	
	Mary (Molly) E. Ceperley	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1) The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2) Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 2, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

In claim 2, line four, it is unclear what is meant by the term "anthrathione". This does not appear to be a conventional chemical term which defines a well known chemical structure.

3) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5) Claims 1, 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by each of Zalipsky (Bioconjugate Chem. (1995), vol. 6, pages 150-165), BEHRINGWERKE (WO

99/07744), Bertozzi et al (J. Organic Chemistry, (1991) vol. 56, no. 13, pages 4326-4329), KONISHIROKU (JP 0822673), or BECTON (WO 99/17120).

Each of the references describes at least one compound which meets the structural requirements of and therefore anticipates a compound of formula (I) of claim 1, i.e. a compound containing a linker with a different type of functional group present on each end. See Zalipsky: page 151, first column, first full paragraph; page 158, "Heterobifunctional Derivatives of PEG" including alpha-amino-omega-hydroxy-PEG; page 159, formulas **29**-**33**; page 160, first column, first paragraph under Table 2; BEHRINGWERKE: page 21, line 15 (CH_2=$CHCH_2OCH_2(C_2H_3O)$) corresponding to the formula (I) of instant claim 1 wherein Z is an epoxy group, X is CH_2=CH-, Y_{1i} is $-CH_2-$, Q is O, Y_{2j} is $-CH_2-$, and k is 1; Bertozzi et al: formula **3**; KONISHIROKU: page 8, structure **E7** (Chemical Abstract 1996: 731276 [attached]); BECTON: page 2, line 24 – page 3, line 12; the heterobifunctional linker "succinimidyl propionate-PEG-2000-orthopyridyl-disulfide" of page 3, lines 17-18. Note that the only required component of the "linker system" of instant claim 1 is a compound of "formula (I)".

6) Claims 2 and 6-20 are rejected under 35 U.S.C. 102(b) as being anticipated by or under 35 USC 103(a) as being obvious over BECTON (WO 99/17120).

BECTON describes compounds which anticipate the compounds of formula (I) of instant claim 1 and instant claim 2 (wherein X is a disulfide group or a thiol group). See page 2, line 24 – page 3, line 12; the heterobifunctional linker "succinimidyl propionate-PEG-2000-orthopyridyl-disulfide" of page 3, lines 17-18. The reference further describes the conjugation of these PEG linkers to a solid phase (page 2, line 24 – page 3, line 4), for example, a resin or other type of solid phase depending on the intended application (page 3, lines 3-4). This description anticipates the "surface carrying a linker system" of instant claim 6.

The features of the dependent claims are either specifically described by the reference (e.g. for the "polymer surface" of instant claim 8, see the PMMA-NH2 of page 3, line 2 of the reference) or constitute obvious variations in parameters which are routinely modified in the art

(e.g. for the choice of complementary binding partners of instant claims 11-14, see claims 7-10 of the reference; for the conventional applications of solid phase-linker-biomolecule conjugates of claims 15-19, see the "Background of Invention" section of the reference) and which have not been described as critical to the practice of the invention.

7) Claims 2, 3, 6-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Zalipsky (Bioconjugate Chemistry (1995), no. 6, pages 150-165).

Zalipsky describes compounds which anticipate the compounds of instant claim 2. See the heterobifunctional PEG linkers of page 151, first column, first full paragraph; page 158, "Heterobifunctional Derivatives of PEG" including alpha-amino-omega-hydroxy-PEG; page 159, formulas **29-33**; page 160, first column, first paragraph under Table 2. The reference further describes the conjugation of these PEG linkers to solid phases (see the INTRODUCTION), for example, the "PEG-grafted liposomes" of Table 1 or the last paragraph of page 158 "potential utility of heterobifunctional derivatives of PEG as...spacers between surfaces and various ligands". These descriptions of the solid phase-linker-biomolecule conjugates of the reference anticipate the "surface carrying a linker system" of instant claim 6.

The features of the dependent claims are either specifically described by the reference (e.g. for the "polymer surface" of instant claim 8, see the amino-methyl polystyrene solid phase of page 159, second column, of the reference) or constitute obvious variations in parameters which are routinely modified in the art (e.g. for the choice of complementary binding partners of instant claims 11-14, see page 150, next to the last paragraph, and Table 1 of the reference; for the conventional applications of solid phase-linker-biomolecule conjugates of claims 15-19, see the INTRODUCTION section of the reference) and which have not been described as critical to the practice of the invention.

8) Claims 6-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***a)*** Bertozzi et al taken alone or in combination with each of ***b)*** Zalipsky or BECTON (references of record in the rejections above).

Bertozzi et al describe heterobifunctional PEG linkers which are disclosed as being useful in drug delivery and protein immobilization (see formula **3** and page 4326, the first paragraph of the article; page 4327, second column, second paragraph: "compound **3** and its derivatives will find use in the conjugation of biomolecules to proteins, drugs, or other probes"). These heterobifunctional PEG linkers anticipate the compounds of formula (I) of instant claim 1. In view of the generalized teaching of the conventional use of these conjugates to link biomolecules to other moieties as described above, it is considered to be well within the level of skill in the art and therefore obvious to couple the heterobifunctional PEG derivatives of Bertozzi et al to solid phases for use in conventional specific binding assay formats, as claimed. Alternatively, given the teachings of both Zalipsky and BECTON of the conventional use of heterobifunctional PEG derivatives coupled to solid supports in solid phase specific binding assays (see the descriptions of these references in the above rejections), it would obvious to similarly couple an equivalent heterobifunctional PEG linker, namely that of Bertozzi et al, to a solid phase for use in a specific binding assay, as claimed.

9) Claims 6-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over BEHRINGWERKE (of record in paragraph ***5)*** above).

BEHRINGWERKE describes a compound which anticipates at least one compound of formula (I) of instant claim 1. See the reference at page 21, line 15, the compound $CH_2=CHCH_2OCH_2(C_2H_3O)$ corresponding to the formula (I) of instant claim 1 wherein Z is an epoxy group, X is $CH_2=CH-$, Y_{1i} is $-CH_2-$, Q is O, Y_{2j} is $-CH_2-$, and k is 1. The reference further describes the coupling of this heterobifunctional linker to both a solid phase (dextran) and a biomolecule (see page 25, lines 8-19) and the use of this solid phase in conventional assays for

analytes (see page 26, lines 4-15). This description anticipates the "surface" of instant claim 6. The features of the dependent claims are either specifically described by the references (e.g. for the conventional specific binding pairs of claims 11-14, see page 8, lines 5-20 of the reference; for conventional solid phases, see page 15, lines 4-16 of the reference) or constitute obvious variations in parameters which are routinely modified in the art (e.g. using patterned arrays of biomolecules on the solid phase of instant claim 7) and which have not been described as critical to the practice of the invention.

10) Claims 1-13, 15, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by or under 35 USC 103(a) as being obvious over GENSET (WO 95/01987).

GENSET describes a solid support to which an epoxy-trimethoxysilane functionalized compound is coupled. The epoxy-trimethoxysilane functionalized compound corresponds to and anticipates compound of instant claim 1, formula (I). See page 15, lines 18-35 and page 14, lines 15-22 of the reference. The reference further describes a conjugate of this heterobifunctional compound with both a solid support and a biomolecule (nucleic acid) which anticipates the surface of instant claim 6 and its method of use in binding the biomolecule to its specific binding partner (instant claim 17: "isolation of a biomolecule which is a partner of a specifically interacting system of complementary binding partners"). The features of the dependent claims are either specifically described by the references (e.g. the biomolecule attached to the solid phase is a nucleic acid (instant claims 12 and 13); conventional solid support materials of instant claim 8 [see claim 16 of the reference]) or constitute obvious variations in parameters which are routinely modified in the art (e.g. conventional patterning of an array on a surface (instant claim 7)) and which have not been described as critical to the practice of the invention.

11) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary (Molly) E. Ceperley whose telephone number is (703) 308-4239. The examiner can normally be reached from 8 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le, can be reached on (703) 305-3399. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-4556 or (703) 305-3592.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Mary E. Ceperley

August 26, 2003

Mary (Molly) E. Ceperley
Primary Examiner
Art Unit 1641